EFFECTS OF BISPHENOL A ON EARLY DEVELOPMENT OF TWO ASCIDIAN SPECIES

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Bisphenol A (BPA) is an organic compound present in plastic products that is released into the environment after degradation. BPA is both a teratogenic substance and an endocrine disruptor.[1] The phylogenetic position of tunicates as sister group of vertebrates and their cosmopolitan distribution in marine ecosystems make them reliable model organisms for ecotoxicology bioassays.[2] We tested the effects of different concentration of BPA (0.1, 0.5, 1, 5, 10, and 20 μM) on sperm viability, fertilization and embryogenesis of two ascidian species, *Phallusia mammillata* and *Ciona intestinalis*. We evaluated the type and the incidence of induced malformations. Then we focused on the effects on the nervous system performing an immunostaining of central nervous system (CNS) and whole mount in situ hybridization (WISH) with neural specific markers. Exposure of sperm to BPA did not influence fertilization rate. Co-exposure of eggs and sperm to concentrations higher than 5μM caused incomplete division of zygote that did not develop further. In *P. mammillata,* embryonic development was altered by 20μM BPA causing a severe phenotype with malformed sensory organs in almost all treated larvae. In *C. intestinalis* 20 μM BPA was lethal, while 10 μM concentration caused alteration to the sensory organs, indicating that *C. intestinalis* is less tolerant to BPA. Nervous system is a target of BPA action that caused an altered pattern of neural fibers. WISH with Ci-GAD and Ci-TH showed an alteration of dopaminergic and GABAergic cells after exposure to 10 μM BPA. These results showed that the most sensitive process to BPA is the first cell division. After 2-cell stage, higher concentrations are required to alter the development. BPA confirmed its teratogenic effects on ascidians [3,4] and its interference with CNS development.

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4. Cangialosi MV et al.Caryologia, 2013, 66, 97-102